The Builder.

No. CCCXVI.

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"DO pray tell me exactly how to make our house dry." "How shall we prevent the damp destroying the wood linings where there are any against our church walls, and producing ugly stains where there are none?" "Be so kind as to explain to us clearly how we may prevent our drawing-room chimney from smoking and spoiling the decorations for which we have just now paid a hundred and fifty pounds." "Please give me in few words, and not technically, a comprehensive system of ventilation for my residence."——Such, literally, are some of the requests which are forwarded to us week after week, and week after week again. Within these last six days we have received no less than four to the effect of the first of them alone.

There are usually no particulars,—without which even an approximate answer could not be given; and we are expected, empirically, to provide a cure applicable to any sort of case. Even if particulars be given, however, we are compelled to decline complying with such requests, for reasons which ought to be obvious. The general questions involved in such inquiries, as we recently had occasion to say with regard to heating, we have often discussed, and we shall, of course, continue to pursue the same system, but their application to special cases must be left to those who are enabled to examine the premises and weigh the various existing circumstances.

The endeavour to gain a cure for a damp or smoky house is not to be wondered at, the evils of either are so great and so obstinate. To obtain a perfectly dry house is no trifling achievement, and is seldom done. Consideration should more often be given to this, when building, than is now the case, especially in putting in the foundations and carrying up the underground work. When soft spongy bricks, or even good bricks or masonry, are placed on damp soil, forming a dry area, between the side of a wall and ground which may be against it, is of little use, because the damp will be absorbed from the bottom and rise, brick by brick (by capillary attraction), up the wall, until it reach a point where it is carried off by the external atmosphere or other influences. A layer of concrete under all the walls of a building (an excellent step in many other respects), will be found of great use in preventing the rise of damp. The bricks for the footings—if bricks are used—should be sound and dense, as slightly absorbent as they can be had; and the employment of cement, instead of mortar, in this position, is very desirable, and would make a scarcely appreciable difference in the cost of the structure. And, indeed, it may be said of good and bad work generally, that the expense of the former over the latter, considered as a per-centage on the whole cost of the building, would be in most cases trifling, and not to be weighed in any against the advantages which attend the former.

The ground, then, being kept off the external face of the wall by a dry area (formed, say, by a 4½-inch wall placed 4 inches from the face in question, and arranged so as to admit of the circulation of air), and the internal face freed from the soil, or protected from it, much would have been done towards preventing the evil so far as the bottom is concerned.

In many cases it is desirable to take out the ground from the area enclosed by the building, and substitute a rough sort of concrete, or dry brick rubbish grouted *in situ*, to keep down damp vapours; and in others to provide an additional precaution in the shape of a layer of impermeable matter in all the walls above the level of the soil. A layer of slates in cement is often used for this purpose. In some cases the horizontal surface of the wall is covered with a thin sheet of lead, but the duration of this for any length of time could not always be depended on.

In the case of a public building in Hull, where *zinc*, bedded in loam, and having the course of bricks immediately above it bedded in the same material, was thus employed, the zinc was found, when examined nine months after, at the time of introducing hot-water pipes, full of holes, and in a rapid state of oxidation. In many churches the earth lies against the walls to a higher level even than the floor of the church: as a matter of course, the walls are saturated with moisture,—the air within the church is affected by it; the woodwork in contact with the walls is rotted. Clearing away the earth so as to admit the sun and air to the walls, and forming a paved channel close against them, all round, so as to take away the surface-water, would often do much towards a cure.

There appears to be strong evidence in favour of the use of asphalte for the above purpose. A writer in M. Daly's *Revue Générale de l'Architecture*, quoted in the appendix to the second report of the Commissioners on the Fine Arts, says,—"In 1839 I superintended the construction of a house of three stories on the Lac d'Enghien. The foundation of the building is constantly in water, about 19½ inches below the level of the ground-floor. The entire horizontal surface of the external and internal walls was covered, at the level of the internal ground-floor, with a layer of Seyssel asphalte, less than half an inch thick, over which coarse sand was spread. Since the above date no trace of damp has shown itself round the walls of the lower story, which are for the most part painted in oil of a grey stone colour. It is well known that the least moisture produces round spots, darker or lighter, on walls so painted. Yet the pavement of the floor, resting on the soil itself, is only about 2½ inches above the external surface of the soil, and only 19½ inches at the utmost above that of the sheet of water."

In a lodge which the same writer built on a higher level, less exposed to moisture, the asphalte was not used, and there, he says, the walls are spotted with damp. And of another house built at the same period, he says,—"The area of the ground-floor of this second house is 2 feet 1½ inch above the level of the garden, and rests on sleeper-joists separated from the soil by an empty space of above 2 feet 7 inches in height, which is ventilated by numerous air-holes. Before this floor was laid, the horizontal surface of the foundation walls had been covered with a layer of Roman cement, about an inch thick. Notwithstanding all these precautions the damp has ascended the walls as high as 3 feet and some inches above the level of the flooring.*"

To prevent a partial slip of the materials in the event of an unequal settlement of the foundations, where the layer of asphalte was used, rows of flints were incrusted midway in the thickness of the masonry (and covered by the asphalte), to form a sort of key.

Various compositions have been proposed at different times in our pages for preventing damp from penetrating enclosing walls. Amongst the prescriptions is one which some of our querists, who were not then amongst our subscribers, may be glad to have. It came from a practical man, and is as follows:—

"Boil two quarts of tar with two ounces of kitchen grease, for a quarter of an hour, in an iron pot; add some of this tar to a mixture of slaked lime and powdered glass which have passed through a flour sieve and been dried completely over the fire in an iron pot, in the proportion of two parts of lime and one of glass, till the mixture becomes of the consistence of thin plaster. This cement must be used immediately after being mixed. It is not well to mix more at a time than will coat one square foot of wall, as it quickly becomes too hard for use, and continues to increase its hardness for three weeks. Great care must be taken to prevent any moisture from mixing with the cement. For a wall which is merely damp it will be sufficient to lay on one coating of cement about one-eighth of an inch thick, but should the wall be more than damp or wet, it will be necessary to coat it a second time. Plaster made of lime, hair, and plaster of Paris, may be afterwards laid on the cement. This cement when put in water will suffer neither an increase nor diminution in its weight."

The great point is, however, in all cases to take the evil at its source, and prevent the access of wet to the wall.

When dampness proceeds from deliquescence, nitrate of soda, &c., being present in the mortar,—washing the wall with a strong solution of alum has been tried with success.

In the report of the Fine Arts' Commissioners, to which we have already alluded, an account is given of the means of excluding damp from the internal surface of walls, not protected above the foundation in the way we have mentioned, by two French chemists, MM. D'Arcet and Thénard. To prepare the cupola of the Pantheon, Paris, for painting on, the face of the stones composing it was heated bit by bit, and a composition applied consisting of one part wax and three parts of oil, boiled with one-tenth of its weight of litharge. The absorption took place readily by means of heat, and the liquid penetrated the stone from a quarter to half-an-inch. The composition acquired solidity as it cooled, and became hard in six weeks or two months.

For ordinary purposes resin might be substituted for wax: the ingredients then are, one part of lithargized oil to two or three parts of resin. This composition has been employed with effect, with the aid of heat, to protect internal walls from damp. A remarkable instance of its successful application, related in the same memoir, is here added. "Two rooms on the basement story at the Sorbonne happen to be several feet lower, on the east and south sides, than the ground-level of the neighbouring houses. The walls of the two rooms on these sides are impregnated with saltpetre. Some years since it was thought advisable to coat them with stucco, in the hope of driving the saltpetre to the outside; but it penetrated the stucco, and re-appeared on its surface, producing so much damp that the plaster began to be decomposed, and the place became

* A similar instance of the inefficacy of cement for the purpose in question is recorded in the "Transactions of the Institute of British Architects," vol. i., p. 59.

uninhabitable even in summer. Our method was tried in these rooms in the following manner:—A mastic was composed, consisting of one part linseed oil, boiled with one-tenth of its weight of litharge, and two parts of resin. The latter was melted in the lithargized oil in a cast-iron vessel, the fire being duly regulated. The substances tumefied considerably at first, but, the fusion once completed, this effect ceased: the composition was suffered to cool, to be again heated for use. The tumefaction which takes place requires that the resin should be dissolved in the oil by degrees, otherwise it will overflow. The walls being very damp, it was necessary to dry them by means of a portable furnace."

The plaster was first thoroughly dried, then heated piece by piece, to enable the mastic to penetrate it: the mastic was applied without intermission till the plaster ceased to absorb.

A similar way of rendering pavements dry is also described. Vitruvius recommends a mixture of oil and lime as a cement well calculated to exclude damp from pavements.

This subject, which can scarcely be called a *dry* one, deserves further consideration.

PROFESSOR COCKERELL'S LECTURES ON ARCHITECTURE.

The fifth lecture of this course was delivered on Thursday, the 1st instant. The professor began by expressing a hope that, in speculating on the subject of classical art, he had not disseminated an idea that no other school was worthy of our regard. Each system had its proper application. He believed that the supremacy of classical art was as incontrovertible as was our superiority in mental and moral philosophy, and every discovery tended to the establishment of this fact. The Greeks ever would be our masters in art, and those who followed them, as the Romans and the artists of the Revival, had their proportionate measure of our regard.

He remarked, that if we looked to the commentators on Vitruvius, we were struck with their comparative ignorance of things with which we had become well acquainted. In his own time, great advances had been made, down to the discovery of the *scamilli impares* in Athenian buildings, by Mr. Penrose, and he inferred that we were only on the threshold of accurate knowledge of the principles of all that we now so empirically admired. In *proportion*, especially, we had much to learn, and he considered that there was room for glory to our own country, by a new edition of Vitruvius.

The progress of investigation, from time to time demanded fresh examination of all subjects. In the history of Greece and Rome, all early histories were now as waste paper; in mediæval architecture, the statements of the earlier writers, since the labours of Professor Willis, would have to be re-cast. It was to the abuse, and not the use, of classical architecture that certain of his strictures had been directed. He recommended a latitudinarian spirit, rather than one of bigotry, in regard to style. Each peculiarity of architecture had its application to time and place. Nature was eminently latitudinarian, but nevertheless was governed by principles. He had therefore recommended the study of nature, and it was better to become pupils of her than of Ictinus, Phidias, or Inigo Jones.

Quoting a passage from Alberti, to the effect that beauty was never distinct from utility, he remarked that utility was the characteristic of the Roman works, which were those of engineering, and the same might be said in England, for though he had never found any objection expressed to beauty in a design, he had certainly never found it enjoined as a necessity.

On the subject of proportion, the professor remarked that each master had a theory of his own. In some measure we all judged by a natural instinct, and we flattered ourselves that we had an eye for proportion. But, whilst, as Vitruvius said, other men than the artist could discover the good and the bad, the difference between the artist and the workman was, that one could foresee, and the other could not. He urged the importance of the study of proportion, in order to avoid those lamentable failures of which there were such frequent instances. The architect of a building often found too late, that with more modesty, and with good advice, and repeated study in drawing, and above all by models, he might have better attained the effect which he sought to impress upon the child of his hopes. Yet the architect should not consult too much his friend, nor too much his enemy, but rather endeavour to avoid the prejudices of each. He impressed upon his hearers the importance of recollecting the wonderful power of proportion. By it, not only character, but magnitude was given to a building; it could make the small look large, and the large look small. In illustration of the former characteristic, he quoted a passage from an author, descriptive of a small figure of Hercules, which, though it might be held in the hand, as you looked at it seemed to expand into a colossus; and of the latter, he instanced the interior of St. Peter's, at Rome, which was so ill devised that it actually appeared smaller than it was, a great error, and in expense extravagant in proportion to the result. Why were these opposite effects?

Proportion, he defined to be of three kinds:—1st. Proportion of elements, expressed in the orders; 2nd. Proportion of cubes and solids, which would govern that of halls and apartments; and 3rd. The proportion of areas, courts, and squares. In the orders we found expressed, in the most perfect manner, the charm of quantities. The best masters had constantly devoted their attention to these features of architecture; so much so, that Wren complained, that architects attended to them as though they were the whole matter of the art. In considering the question of magnitude, it was to be remarked, how in the early Doric there were larger capitals and rapidly diminishing shafts, as compared with the late Doric, in which we noticed a gradual tendency to the vertical and pyramidal. Greek architecture was characterised by a certain finality, and it resulted from that characteristic, that where applied as a lower story it was bad, as we saw it in Buckingham Palace. He inferred that it was bad to diminish greatly the Doric in street architecture, and that it was from this application of it by the Romans that the altered diminution resulted. He inferred, too, that the large capital was found incompatible with the altered position, and that it was intended to give magnitude by being diminished.

The Grecian Doric order, when alone, would never look large; whilst the Roman columns, as that of Trajan, shewed the perfect consideration for this object of proportion. In the Corinthian order, varying the height of the capital altered the appearance of length in the columns; a lofty capital made the column look short; whilst by diminishing the capital, magnitude was attained. Similar means were apparent in all three of the orders. The system was found in the Parthenon especially. He found from Vitruvius, that the ancients recognised that the proportion should alter with the magnitude. In the temple of the Giants at Agrigentum, the columns of which had a diameter of 13 feet, we found base mouldings,—an entirely new feature in the Grecian Doric. At Pæstum, instead of the ordinary number, the columns had each twenty-four flutes. But at Sunium, where they were small, and where breadth of effect in the temple, viewed from the sea, was desirable, they had sixteen flutes. I am not, said the architect, raising a toy or a model, but a building in which I must take into consideration all circumstances of size and position. He thought, therefore, that had he large columns to deal with, he should increase the number of the flutes, and diminish the capitals, whilst in small columns he might have sixteen or twelve flutes. As we found in nature, the youthful face had smooth outlines; but with the new dignity of strength and manhood, the features became more marked. The oak, as a young sapling, differed in like manner from the full grown tree, with its arms set at right angles, and the corrugated surface of its bark. To give magnitude, therefore, multitude of parts was necessary. Comparing the front of St. Peter's at Rome with that of the Parthenon, how inferior was the former. The four columns in the front were of immense size, yet the façade was one which would have been better suited to a parish church than to so vast a cathedral. It was to give magnitude that the new Parthenon had eight columns, instead of six, the number in the former building.

The professor then alluded to a theory which he had broached in former lectures, and which will be found referred to in our reports—viz., that beauty of proportion arose from inequalities. He illustrated this by diagrams, comparing the unequal disposition of parts in the man, with the opposite mode of distribution in the monkey. In like manner the horse was contrasted with the ass. The principle was shewn to be of similar value in proportioning the heights of stories in houses. This, he said, was the Ευρυθμια of Vitruvius.

Vitruvius had given directions for observing the different "styles" or dispositions of columns, as 1½ diameters apart for the pycnostyle, and so on. These directions were very important; but there was another practical point to be considered along with this—viz., varieties of height, according to the character of the building, whether tall or short. Now, this had never been sufficiently well attended to, for the commentators had drawn their illustrations to all scales, or according to the size of the paper. To render this as clear as requisite, the different "styles" should have been drawn to the same scale. Taking the pycnostyle and araeostyle as the two extremes, it would then be apparent there were certain characters; as in the latter instance, the low and compressed, and in the former, the tall—the other "styles" ranging between these extremes. Each of these distinct orders of disposition, no doubt, had its appropriate application. Now, instead of observing such a system as that here shadowed forth, each of us had a type by which we measured all things. One artist invariably made his figures tall, another short—but this was not nature. An architect, wanting a door, would go to an example, or to Sir William Chambers, and, without reflecting, would apply any proportion or size of aperture indifferently to a broad or tall disposition of columns. The professor shewed that in the araeostyle the door should be large in proportion to the order; whilst, in the pycnostyle, the opposite method should be practised; and so, he said, every aperture, and indeed every stone, should have a general harmony with the design and character of the particular building. But, in opposition to this, one master was for the broad, another for the narrow gauge.

The professor vindicated the authority of Vitruvius from the aspersions cast upon it, through ignorance of its true value, as shown in the instance he had given, by modern writers, who were certainly not artists. He quoted the lines from the Iliad, in which Helen describes the figures of Agamemnon, Ulysses, and Ajax, and said that these were no doubt designed by the poet to express what we found in the works of Albert Durer, Titian, and sometimes Raffaelle, viz., *character*. Each of the characters we might affect had its own proper modulus or type, and by applying each in its place, we obtained that contrast and beauty which was the charm of architecture. He instanced the guard-house at Cologne, by Schinkel, as admirably suited to its position. He also mentioned Nottingham Castle, said to be a work of Inigo Jones, which contained some singularities, but had an admirable effect at a distance. Another building was the Loggia of the merchants, at Venice, by Sansovino. It was only 30 feet high, and in any case, to give dignity to a building which was at the foot of a tower 300 feet in height, was not easy. The professor pointed out how this was effected, and said that the result was a low compressed character, which was in complete contrast with the tower above. Sansovino, on other occasions, had shown how he could feel like an artist, when he had opposite circumstances to deal with, when he adopted the tall character: his art was not that of a bigot; he suited the character to the place. In giving examples of successful attention to these principles, the church of St. Paul, Covent Garden, could not be forgotten, as an instance of the fine effect of the low broad character.

It would be recollected, the professor said, in

considering subjects of this kind with the aid of books, that illustrations were not drawn to the same scale. He said that considerations of this sort were much neglected in buildings. For example, we found the eustyle in relief, which made all the difference, and windows imprisoned as it were between the columns. He instanced the front of Lord Spencer's house, in the Green-park, as an example of the successful treatment of an engaged order with windows, the columns being there placed diastyle, and consequently there was complete space for the windows, and all dressings. In our copies of Greek temples on the contrary, we had generally fallen into the error which the architect of that beautiful building had avoided. We had, indeed, been Greek mad, but not from too much learning, but from too little. He believed that, some day, a type of proportion would be discovered, applicable to every building. Wren had an eye to this. The interior of St. James's Church, Piccadilly, had a certain proportion of height, and magnitude was gained by that proportion. He instanced Sir Robert Taylor's garden-front of the Bank, as an instance of successful proportion. Sanmichele was a great master in this; his gate in the front of the Lido had a rusticated Doric order, managed with the hand of a giant. In civic buildings he said, where frequent piers could not be avoided, character might be given by decorating the alternate windows.

The principle of a certain modulus of proportion, applied to interiors. St. Peter's, at Rome, ought to have had the bridge-like expanse, rather than, with a more vast dimension, the ordinary proportion of a church. In mediæval architecture, the height was governed by the point of an equilateral triangle, and Wren was so true a mason, that he followed the same method. He concluded by remarking, that although there were many things which could hardly be taught, it behoved us still to reflect, and to acquire all the skill which we could possess, by learning on every side, in preference to depending upon the inspiration of genius.

ENFRANCHISEMENT OF LEASEHOLDS.

As no question of a novel nature can have a more beneficial influence upon the arts and architecture, nor a greater claim to the attention of the resident population of the metropolis, than this, no apology is needed for a few additional remarks upon it.

Having before shown that the proprietary, or landlord class, can make no objection to enfranchisement on the score of inequitable adjustment, and that full compensation can be meted out to them by valuation juries,—now it only remains to prove,—

That changes more direct, not to say more arbitrary and violent, have been made by enactments of the legislative Parliament, in all sorts of property, whether lay or ecclesiastical, corporate or private.

That where the interests of the many, urged by the public voice, or the expediency of an altered system of law (led on by *retired judges*) required a sweeping charge in our social or relative positions as to property, no respect for private privileges interposed to stop the invasion of rights thitherto considered sacred.

If rights in law were immutable, and the "*nolumus leges Angliæ mutari*" of Magna Charta, were still to coerce the advances of science and arts, and to conserve the usages of black letter jurisprudence, what a stand-still generation should we be! What was suited to the state of society in the days of King John, became prejudicial in those of Henry the Eighth; and the expanding mind of a great nation in the latter reigns—discovering that, in progression of time and prosperity, the shackles of old institutions were unsuited to the giant growth of a matured power—emancipated itself from the trammels of prejudice, and scrupled not to reform or abrogate those laws which repressed its luctant energies. It was in this spirit that the Act of Limitation was passed which abolished, totally abolished, all claims, grounded on the 21st James II., to debt, on which legal process had not been entered up for a period of six years. If any one act of the Legislature could be stigmatized as an act of *spoliation*, it was that which deprived the creditor, who was too lenient, or perhaps who had slept upon his right, of all suit or demand against his debtor, who had eluded or avoided the demand of his debt for that period. It would be curious to ascertain what might have been the sum total of immunity from payment consequent upon that act; of how many millions, or hundreds of millions the tradesmen and merchant have been debarred, and what portion of that immunity fell into the lap of the Lords and Commons, their relatives, and adherents. In this case the right of the honest tradesman was lost, and totally confiscated, no valuation having here interposed to give him a *pro tanto* annuity over time, as a requital; and yet we heard little complaint, certainly of no public demonstration against the passing of that law, for it was manifest to all that much litigation was saved, and the greater good achieved by that act of extinction. Another very recent interference with vested rights, took place on the enactment of 34 William IV., chapter 27. By that statute the fact of possession for twenty years conferred on the holder or tenant of fixed property, the absolute freehold title as indefeasible against all claimants. Here was an utter annihilation and defeasance of all heritable claims on property, so circumstanced, how clear soever might be its deduction, and although the family of the rightful claimant might have been in possession up to twenty-one years antecedent, or his ancestors from the days of Harold in lineal succession.

We will not inquire what were the operations of this statute, nor what complications of interests were set at rest by it, but only adduce these examples to prove that legislative wisdom hath abrogated and wholly annulled usages which hitherto admitted claims (rightful claims) to fixed property, and that, too, without contemplating any equivalent.

The remarks which have been made by powerful parties who are opposed to the enfranchisement of leasehold property, induce me to offer these examples in addition to those already instanced, of "the enfranchisement of copyhold tenures," and the "valuation, freehold, leasehold, copyhold, &c., Act, empowering railway companies to purchase."

However, in the proposed enfranchisement, or rather, the continuation in perpetuity of existing leases (originally above twenty-one years) to the tenants in possession, the rents now payable must also be continued in perpetuity; and as in the great majority of cases, householders wishing to renew or perpetuate their tenures, would take that perpetuity at an increased rental, rather than on purchase: so the immediate yearly income of the great landlords should be vastly increased; as, for instance, a house in Belgrave-square having 60 years to run, at 100*l.* a-year ground-rent, but now worth in the market 500*l.* a-year, might, by the payment (or valuation), be subjected to an additional 50*l.* a-year; a sum which, by accumulation on compound interest, must, in 60 years, exceed the value of the mansion at the end of the lease.

In the valuation of shorter terms, unlapsed, the increased rent would be proportionately larger; as for example, a house in Grosvenor-square having but 20 years of lease to expire, and subject to 50*l.* a-year, the present value being 500*l.* a-year; in this case 150*l.* a-year additional rent for the perpetuity might not be considered excessive; but however it might appear to others, the occupant would, in nine cases out of ten, rather pay it than suffer his term to lapse; and the more especially so, as on the renewed lease he might modernize, improve, and consolidate his mansion; whereas, if he were to suffer the lease to lapse, he must continue to occupy a dingy dwelling, falling into decadence, unsuited to his requirements, and to the improving taste of the day.

Hence it is clear that the head proprietor can in no case get less than his original rent, with a sum of money equivalent to the improved value of the premises leased in perpetuity; and that by such arrangements as should give an increased rental, instead of purchase, the present actual rental of the landlord must be trebled.

On one estate only, the estimate of increase (rough though it be) is not far from the mark. It stands thus: Of 200,000*l.* a-year, one-half would be perpetuated on an increased rental adding at once 200,000*l.* a-year! one-fourth would be purchased at the present estimated rental, or 50,000*l.* a-year, being the reduplicated amount of rent, and this, at twenty years' purchase, would produce one million in money, which would be, in round numbers, (at medium fund price) 30,000*l.* a year—leaving still the head rent undisturbed; and the other fourth part would probably be allowed to run out of lease.

This estate then, now producing 200,000*l.* a-year, by such regulation would return 330,000*l.* a-year until the lapse of the remaining fourth part, and of that portion the returns would be trebled on reletting, realizing a total income of 480,000*l.* a-year.

In estates which are strictly entailed, provision should be made by the Legislature for entailing in the funds of the country the amount of purchase money paid on enfranchisement,—these funds being subject to the same limitations as the houses converted into money. On the estate before referred to, no less a sum than one million would probably be invested,—this on only one estate. The total sum so invested must be in the event enormous; and the fixed capitalization of such amounts would obviously tend to the stability of Consols, from the value of which, at the time of enfranchisement, the equivalent, or price, would be calculated.

No one can argue that this is a confiscation; in truth there are but very few great proprietors in London and the environs—I should say but twenty at the most, possessing colossal incomes; and taking these twenty at an average of 2,000 houses each, there are of consequence 40,000 householders who would be benefited by the proposed enfranchisement, who, being tenants at a rent certain (that rent not being immoderate), would expend large sums in the consolidation and improvement, as well as the embellishment of their holdings. What a stimulus would this apply to the languishing tradesman—the bricklayer, mason, carpenter, and all the artists who follow in their train!

But let the present system of terminable leases go on for fifty years more, and then see the state of society,—all the habitations of the great towns will be at the disposal of twenty proprietors, who may expel, evict, dispossess, and disperse the whole population, as seems best to their lordly wisdom or caprice. Go thou there—rest thou here—this square shall be the abode of lords, that of commoners; this street shall be allotted to the squirearchy, and that to the professions!

One incident may explain more forcibly the tendency of the present practice of *leasing* than all that has preceded:—a certain tract of fields on the leviathan estate near Vauxhall, was let out lately to a great building firm, on a lease for ninety years, on condition of building 5,000 houses; and this at a rental of 5,000*l.* a year,—these houses were to be of a class to assure the expenditure of 1,000*l.* or 1,500*l.* a house. It requires no complex arithmetic to prove that at the end of the term, or on the lapse of three generations, the enormous sum of five millions, disbursed by the public, must, at the expiration of that term, fall into the possession of the lessor lord, or of his posterity; and that the rental of those houses so erected by the community, if averaged at only 100*l.* a year, must make the enormous addition of 500,000*l.* to the rental of the already too-rich landlord. Is this for the advantage of the community? that one family should command whole districts of habitations, and that all mankind should be ousted? The reverse conclusion is so obvious that it needs no elucidation; for better is it that 5,000 householders, with an interest in the tenements, should enjoy their privileges, municipal and other, than that all should fall into only one heritage. But at the end of the ninety-nine years, not only these 5,000 houses, but also, in half that period, 5,000 more of the old town (now the fashionable part), must fall to the same proprietor, unless the wisdom of our Legislature stop this frightful accumulation and forestalling of all fixed property in tenements. The forecast which provideth for a family should provide for a nation; and if the legislature hath the power to interpose a safeguard for the people, there can be no reason why they should not be protected, seeing that an equitable recompense can be made to all superior interests. The enfranchisement of

leaseholds may be a new theory, but it is facile as it is just. The interests of humanity require it; and the consummation of such an act will reflect credit on the member who may carry such a measure as this suggested by

Quondam.

SURFACE-DELINEATION AND PLAN-MODELLING.

CARRINGTON'S MODEL OF YORKSHIRE AND LANCASHIRE.

At the present moment, while sanitary improvements and the general drainage of land occupy so much of the public attention, it is a matter of importance that the most judicious and economical mode of showing the undulating surface of ground, so as to devise the best method of draining it and effecting improvements at the least possible cost, should be known.

The present system of sections and contour lines gives but a partial knowledge of the character of ground, inasmuch as the undulations can only be shown where the traverse is made with the level. Beyond this (on either side of the line traversed), no information is supplied; so that, to arrive at any thing like a knowledge of the surface of a country, many sections and cross-sections are requisite. In like manner, contours following out lines of equal altitude show the form of the ground only where the level passes. Moreover, the expense of contouring a piece of country is more costly than most persons are aware of. To contour ground for practical purposes, so as to enable parties when on the ground to find the line traversed, it is requisite to have the contour line staked out: the distance between the stakes averages about one chain.

For towns, a series of sections taken through the streets is unquestionably the best method of obtaining the different altitudes.

It is surprising to hear so many persons praise the system of contouring towns. Are they aware that, to a great extent, it is fiction? It may look very pretty on paper, and persons may fancy they have a knowledge of the ground from such a mode. Test its accuracy! It will be found void of truth. You cannot follow out a contour line in a town, where its direction would be intercepted by buildings and offsets and obstructions innumerable. Contouring of towns, and of precipitous and rocky grounds, has never yet been accomplished.

Valuable and indispensable as sections are, they fail to give that which is most desirable in designing and carrying out any great work, a comprehensive and detailed whole.

This defect then existing, it seems a matter of regret to find that a beautiful and economical method of delineating ground has been passed over. This method (the horizontal delineation of ground, and which is so little known) was introduced into the Ordnance Department by Mr. Dawson. So valuable and important was this particular study considered, that his Grace the Duke of Wellington, when Master-General of the Ordnance, ordered a limited number of young gentlemen to specifically study that art, in addition to every other branch of surveying.

Mr. Frederic A. Carrington, a gentleman who held an appointment from the Master-General and Board of Ordnance, and who was specially instructed in the above studies, after having delineated large tracts of country, and made finished topographical "hill" drawings for the Ordnance, of more than 8,000 square miles of country, has for the last three years particularly devoted his attention to the delineation of ground, and to modelling for practical purposes.

This system of horizontal delineation (correctly done), combined with a judicious mode of levels, imparts a thorough knowledge of the surface of a country. Minute features, as well as rocky and contorted ground, are clearly expressed: and in designing the improvements and drainage of towns and estates, it is very valuable.

Were London, Liverpool, or any of our great towns surveyed in this manner, not only might the rise and fall of every street be exhibited, but the continuity of the fall. The height in feet at the intersection of the streets, and every other remarkable point, could be added.

Then, as regards estates, take the case of our great landed proprietors, anxious to improve their property in laying out new roads and draining the land.

Supposing they were desirous of carrying out the work progressively, or from year to year, by having the estate delineated in the manner proposed, all improvements, as well as the thorough drainage of the property, could at once be projected; and, if required, laid out with the greatest nicety and economy.

Models of towns, estates, and districts of country, executed in this manner, can be multiplied at a comparatively small cost. They can be produced in a composition resembling ivory, gutta percha, papier maché, &c., impervious to water. Among those we have seen are Blyth and Serlby Hall, in Nottinghamshire (to show its applicability to estates), on a scale of four chains to an inch; that of part of the town of Dundee, on a scale of 100 feet to an inch, for towns and boroughs generally; and, lastly, that which may be called the chief work, in illustration of a tract of country, on a scale of one inch to the mile. The portion chosen for this purpose is, perhaps, among the most difficult and interesting in the kingdom, "the great manufacturing districts of Yorkshire and Lancashire." There is much for contemplation in the district thus embraced, extending from Lincoln westwards some 70 miles, to Congleton, in Cheshire; from Congleton northwards, by Manchester to Burnley (say 45); from Burnley, east, by Bradford and Leeds to South Cave on the Humber; and from the Humber, south to Lincoln,—it forms a parallelogram including a surface of about 3,000 square miles. The site of six and forty cities and towns, villages innumerable, parks, woods, roads, railroads, and canals, are all shown in relief. The sources and windings of all the rivers and streams, among the hills and through the plains; the Trent and the Mersey, the Derwent and the Don, the Calder and the Dane, the Irwell and the Rother, may be seen at a glance.

The physical peculiarities are, if anything, still more interesting. At once it may be seen why geologists call the country near Manchester, the "Manchester basin"; the term is most apt, for the hills form a perfect crescent around it, of which it is as nearly as possible the centre. The great mountain ridge that divides Lancashire and Yorkshire, running in a north-west and south-east direction, is, to the north-east of Manchester, broken in a most remarkable manner, forming at this point the celebrated pass of Todmorden, which, circuitous and narrow, has been taken advantage of for turnpike, canal, and railroad, as affording, in the first instance, the easiest and best transit between the counties.

The summit ridge previously named, formed of millstone grit, varying from 1,500 to 2,000 feet above the sea (with the Lancashire and Yorkshire coal fields on its west and east side), is divided in two at the Peak of Derby, to make way for the upheaved mass of mountain limestone, of which the greater part of that county is composed. The next great feature on the Yorkshire side is what may be called the magnesian limestone ridge, from 200 to nearly 600 feet high, gradually dying off in the soft features of the new red sandstone, till lost in the valley of the Trent, and the great flats near the Isle of Axholme, when it is again relieved by the lesser, but well-marked, oolite ridge, on which Lincoln stands, and along which the great line of the Roman road is taken direct to the Humber.

Where the canals were first constructed to aid the transit between the counties, the railroads have followed in nearly a parallel line, with the exception of that great work, the Manchester and Sheffield line. We see in a moment where and to what extent, from the neighbouring hills, the Lancashire towns can be supplied with water for domestic, manufacturing, and sanitary purposes. The same in reference to Yorkshire, and far distant as they are, the whole produce of the sources of the Derwent and the Dove, could be brought to the metropolis, should it so be willed. As it is necessary to impound and store the water in the hill districts for use; so in the plains, an important object is gained if we can regulate the upland drainage, or find means for its being more rapidly carried off from these low lands, in order to bring what are now marshes into cultivation, to turn what is waste to profit, to make what is now a source of disease healthy and valuable.

Again, in a military point of view (for the use of an officer in command), nothing else can at all approach a work of this kind. To the Government such a work (always of course supposing it correct) is invaluable.

What do we know of our exposed southern coast and harbours? If such be the case at home, what must it be in reference to our possessions in the east and elsewhere? Who knows India? What is Sidney like? What are the features of the Cape Colonies and Port Natal?

Impressed with the obvious advantage of this mode of surface-delineation, we are anxious that Mr. Carrington's system should have a fair investigation, and if found to fulfil all that it promises, a liberal encouragement.

PUBLIC BATHS AND WASHHOUSES.

For a special purpose, we are asked for some relative information concerning the baths and washhouses of the metropolis. The baths at George-street are a long strip of a building, irregular, and taking parts of two sides of a square. A general description of it has appeared in our pages.

Those at Glasshouse-yard are merely half a dozen baths fitted up in different parts of the large refuge for the houseless poor. There are also scattered washing tubs and troughs.

The building at Goulston-square ("The Model Establishment,") described in The Builder more than once, covers a piece of ground, not quite rectangular, about 90 feet by 120 feet. It has a basement containing tank, coal cellars, boiler-room, engine-room, towel washing-room, &c., and a ground-floor nearly equally divided into two parts, one the bathhouse and the other the washhouse.

The St. Martin's "baths and laundries," cover a piece of land about 80 feet by 40 feet. The basement has the boiler-room, &c., the ground-floor, the baths, and the first story the washhouse. The model establishment will probably not cost less than 22,000*l.*: it has ninety-four baths, each in a separate apartment 6 feet square, and ninety-six washing places, each with its separate drying closet.

St. Martin's will probably cost 15,000*l.* About sixty-four baths and fifty-six washing places, each with its separate drying closet. Cheaper plans are needed. At Goulston-square they have had and still have to go through the cost and disappointment of experiments. The plans have not been published.

The success at St. Martin's is said to be considerable. With only about thirty baths completed for use, the bathers during the first nineteen days have been 6,701, and the receipts 94*l.* 13*s.* 2*d.*

Baths and washhouses are about to be erected in Macclesfield.

ON THE TOPOGRAPHY AND ANTIQUITIES OF THE CITY OF JERUSALEM.*

The following paper relates first to the topography of the city of Jerusalem, and afterwards to the existing antiquities. To illustrate the topography, I annex a plan taken by me in the year 1825. It was measured under circumstances of considerable difficulty, for at the period of my visit Jerusalem was in the possession of the Arab natives, who had some time before expelled their Turkish governor and his garrison; and during my sojourn there, we were in expectation of a combined attack from the armies of the pashas of Damascus and Acre.

Since then, circumstances have been more favourable for research in the East. From the exhibition of Mr. Catherwood's panorama, and the publications of various travellers, the subject of the topography and antiquity of Jerusalem has engaged the attention of the biblical antiquary, and has given rise to much controversy and to many wild theories. My object in this paper is not so much criticism as to give some information on a subject interesting alike to the architect and the archæologist, and to direct the attention of the members and other

* Read at the ordinary general meeting of the Royal Institute of British Architects, Feb. 5, 1849.

architects who may contemplate a journey abroad, to the fact that a visit to Jerusalem will afford much interest, and if they will give their attention to the investigation of the doubtful points, they will themselves derive much valuable information from the research, and contribute greatly to elucidate biblical antiquity. It requires not only the *accuracy* but the *eye* of the *travelled* architect, who has been accustomed to antiquarian research, to decide on the disputed points; the doubts arise principally from the discoveries and descriptions being by those whose attention had not been previously directed to architectural detail.

The published works of Mr. Williams, Mr. Bartlett, and Dr. Robinson, and the notes by Mr. Tipping to Dr. Trail's new edition of Josephus, with others, will direct the attention of those who may contemplate what is now only a summer's excursion (a visit to the Holy Land) to the debateable ground, and I will take this opportunity to state, that I shall not only be willing, but even feel obliged, by being consulted, as I have many questions to ask and much information to obtain on a subject which has at intervals occupied a portion of my thought.

Jerusalem stands on the southern extremity of an elongated plain of a range of limestone mountains, elevated about 2,000 feet above the Mediterranean Sea. The city is bounded on the east by the valley of Jehosaphat, in which runs the brook Kedron, on the south by the valley of Ben Hinnom, on the west by the valley of Gihon, and on the north by the plain alluded to. The general appearance of the country around is dreary, desolate, and barren; the valleys and ravines, however, are fertile, and the olive tree flourishes on the sides of the hills and ravines. Jerusalem occupied the site of four hills: Zion, or the upper city, on the south-west; Moriah (on which the temple was built), on the east; Bezetha, the new town, on the north; and Acra, the lower city, in the middle, and to the north of Zion. Zion was the highest of the four hills: it is computed about 250 feet above the valley of Jehosophat. A deep valley, called Millo, separated Acra from Moriah, which was in part filled up by the Asmonæan race, in order to join the lower city to the temple. The continuation of the valley is called by Josephus the Tyropoeon, and separates Zion from Acra as well as from Moriah. Zion was probably the first of the hills occupied, and on it stood the city or strong place of the Jebusites, which was finally taken by David A.M. 2957, who made it his capital, instead of Hebron, and called it the City of David. "He built round about from Millo inward," and Hiram, King of Tyre, sent cedars, and carpenters, and masons, and built him (David) a house on Zion. Mount Moriah, at this period, was the threshing-floor of Ornan, the Jebusite, of whom David purchased it, as a site for the house of the Lord, which Solomon began to build 32 years after the defeat of the Jebusites (A.M. 2992).* This mount is also the spot where Abraham had raised an altar to make the offering of his son Isaac as a sacrifice. The building the house of the Lord (Solomon's temple), as described in Kings and Chronicles, has given rise to many ingenious designs, learned dissertations, and curious theories. Solomon† having selected 70,000 men to bear burdens, 80,000 more to hew in the mountains, and 3,600 to oversee them, sent to Hiram, King of Tyre, to send him "a man cunning to work in gold, and in silver, and in brass, and in iron, and in purple, and crimson, and that can skill to grave with the cunning men that are with me in Judah and Jerusalem," whom David his father had provided. And Hiram sent him a cunning man (endued with understanding). From the description by the sacred penman which follows, Wilkins has designed a Greek Doric temple, supposing from the situation of Tyre on the coast that the architecture of Greece at that period was adopted in Syria. I must own I at one time inclined to this view, that is, as regards the style of the architecture of the temple; but after exploring the coast of Syria, and after an examination of the remains of the Egyptian buildings, I have thought it likely that the architecture of the temple resembled more the architecture of Egypt than that of Greece. We know there was much communication between Egypt and Syria. Solomon had horses and linen from there, and married a daughter of Pharaoh; and by a monument cut in the work (of Egyptian design, and of the period assigned to Sesostris), at the Nahr al Kelb, near Beirout, on the coast, a cast of which was brought to this country by Mr. Bonomi, and placed in the British Museum, we see that the architecture of Egypt was used in Syria at a spot more remote from the parent country than even Jerusalem, and a similar monument has been since found in Cyprus, whereas I am not aware that any example exists of Greek architecture of the age of Solomon in Jerusalem, or even Syria.

The two pillars, "Jachin and Boaz," erected before the temple, and "the porch before the house,"* remind me of the Egyptian obelisk and the great propylons, whilst the "chambers round about the house," the "flat ceilings and roofs," resemble much more the temples of Egypt than those of Greece, besides the total absence of any indication of a pediment and slanting roof, in the description of Solomon's temple,—features so prominent in the Greek temples. However, there is little hope of a satisfactory solution of this problem,—the successive destruction and rebuilding of the temple, I fear, has obliterated all traces of its original style.

After the first destruction of the temple by Nebuchadnezar, it was rebuilt and dedicated in the fifth year of the reign of Darius, A.M. 3416. The second temple—of which, I believe, there is no description on record—was rebuilt by Herod about four years before the birth of Christ, after having stood, like the former, about 500 years.

This building of Herod is the temple of the New Testament, and was the scene of many of the events of our Saviour's life. The description of it by Josephus, though perhaps much exaggerated as regards its beauty and dimensions, proves that it was a building of greater magnificence than any of the preceding ones. When more favourable times than the present will allow of excavation and further research on its site, it is probable that many fragments will be brought to light, and a restoration of its main features may be accomplished with some degree of certainty. (Some of the existing antiquities, which I shall hereafter describe, are probably of this period.)

During the great siege of Jerusalem by Titus, A.D. 70 or 72, the destruction of this work of Herod was so complete as to verify the prophecy that "one stone should not be left on another."

Since then the site of the temple has been occupied by various buildings, Christian and Saracenic,—and finally the present mosque of Omar was built, partly of ancient fragments,—a spot so sacred to the Mahommedan that none others are allowed to enter even into the outer enclosure, much less to explore the building, and only a few other individuals by stratagem have succeeded in obtaining a casual inspection of this mosque. M. Bonomi, accompanied by Messrs. Catherwood and Arundale, were however, some few years since, allowed to examine, measure, and make drawings of every part, under a misapprehension of the authorities that they had been deputed by Ibrahim, Pasha of Egypt, to report on the alleged dilapidated state of the mosque.

To proceed with the topography of Jerusalem. It seems probable that Acra was occupied in the time of Solomon, and was always, as it is now, the most populous part of the city.

Bezetha was a suburb occupied by the increasing population until the time of Agrippa, who enclosed it with a wall *a few years after* the crucifixion. (It is necessary to bear this fact in mind, as my plan of the restoration of the city walls, according to Josephus, has relation to *this* circumstance.)

At the *present day* Jerusalem is surrounded by an embattled wall of imposing appearance, built by the Sultan Soleyman A.D. 1542, partly on old foundations; they are about 2½ miles in circuit, built of small squared stones, decorated at intervals by plain patnas, with fragments of older materials, columns, &c., worked in; and in many parts the ancient walls are standing to a considerable extent, both in length and height (which we shall hereafter allude to more particularly). Of the five gates now open, those called Zion and Damascus are the most ornamented, and the latter is a fair specimen of the style of the period. The wall runs in a north-east direction to the Damascus gate, and continues eastward to the north-east boundary of the city, abutting on the valley of Jehosaphat. The wall from thence runs southward, forming the eastern side above the same valley, the greater portion of it being also the enclosure of the temple area, in which is seen an ancient gateway, walled up, known as the Golden Gate. A portion of the south wall of the enclosure of the temple forms likewise the city boundary, from whence there is a considerable jutting out of the wall southward, on a portion of the rock of Moriah, called Ophel. The south wall passing westward across the Tyropoean valley, passes over the upper part of Mount Zion, half of which is now without the walls. At the summit the wall turns off at right angles to the north, where it unites with the citadel, now called David's Castle. This being the entrance from Jaffa and Bethlehem, the gate here is called not only by those names, but also the "Pilgrims' Gate," who generally arrive in the Holy Land by way of Jaffa. The wall diverges to the north-west (and completes the western boundary), where it joins the angle at which I commenced the circuit.

Of the objects of most note within the walls, commencing at the north-western corner, are the Latin Convent, where travellers usually take up their abode;—the Church of the Holy Sepulchre, situate in the western part of the city, a description of which was given us two sessions since by Professor Willis, containing, among other assigned sacred localities, the site of the Crucifixion and the Sepulchre of our Lord, and the cave where St. Helena discovered the cross;—the "Via Dolorosa," or the way by which our Saviour carried the cross from Pilate's house (on the site of which is the present governor's house) to Calvary, passing under by the Gate of Judgment, and the arch of "Ecce homo," which is probably one of the ancient gates. On the site of Pilate's house, the "Scala Santa" (by which Christ ascended), now at Rome, was taken. A large excavation called the Pool of Bethesda, is seen in front of the north wall of the Temple, enclosing probably part of the deep ditch in front of the famous fortress of Antonia. Another pool near to the tower of David, perhaps that formed by Ezekiel, and near the same tower, is the spot where the Protestant Church is being built. The convent of the Armenians is a large building, said to be on the site of the martyrdom of St. James; and, lastly, the mosque of Omar, which is by far the grandest object existing at Jerusalem at this time. Without the walls are some excavated tombs on the north and north-west, and in the Valley of Jehosaphat: those called the pillar of Absalom and the tomb of Zachariah, I described in a paper read here some few years since.

Passing by the garden of Gethsemani, from the valley of Jehosaphat, where exist some olive trees of great antiquity, a road leads to the summit of the Mount of Olives, which commands a fine view of Jerusalem. A hill, called Mount Offence, the traditional site of Solomon's idolatry, and the Hill of Evil Counsel, the supposed site of the house of Caiaphas, where the priests and elders took counsel to destroy Christ, are conspicuous features in the scenery around Jerusalem.

Opposite the village of Siloam is a fountain called of "The Virgin," from whence is a subterranean communication for the water to the Pool of Siloam, by a channel cut in the rock through the ridge called "Ophel." The pool is reached by a descent of time-worn steps: the clear refreshing waters, which ebb and flow, and the beauty of the vegetation around on the walls of this pool, impart a peculiar charm to the spot. This, and the cultivated spot below, at the intersection of the valleys by the Well of Nehemiah, form a sort of oasis in this desolate region.

Near here is a remarkable white mulberry tree, the scene of the martyrdom of Isaiah the prophet.

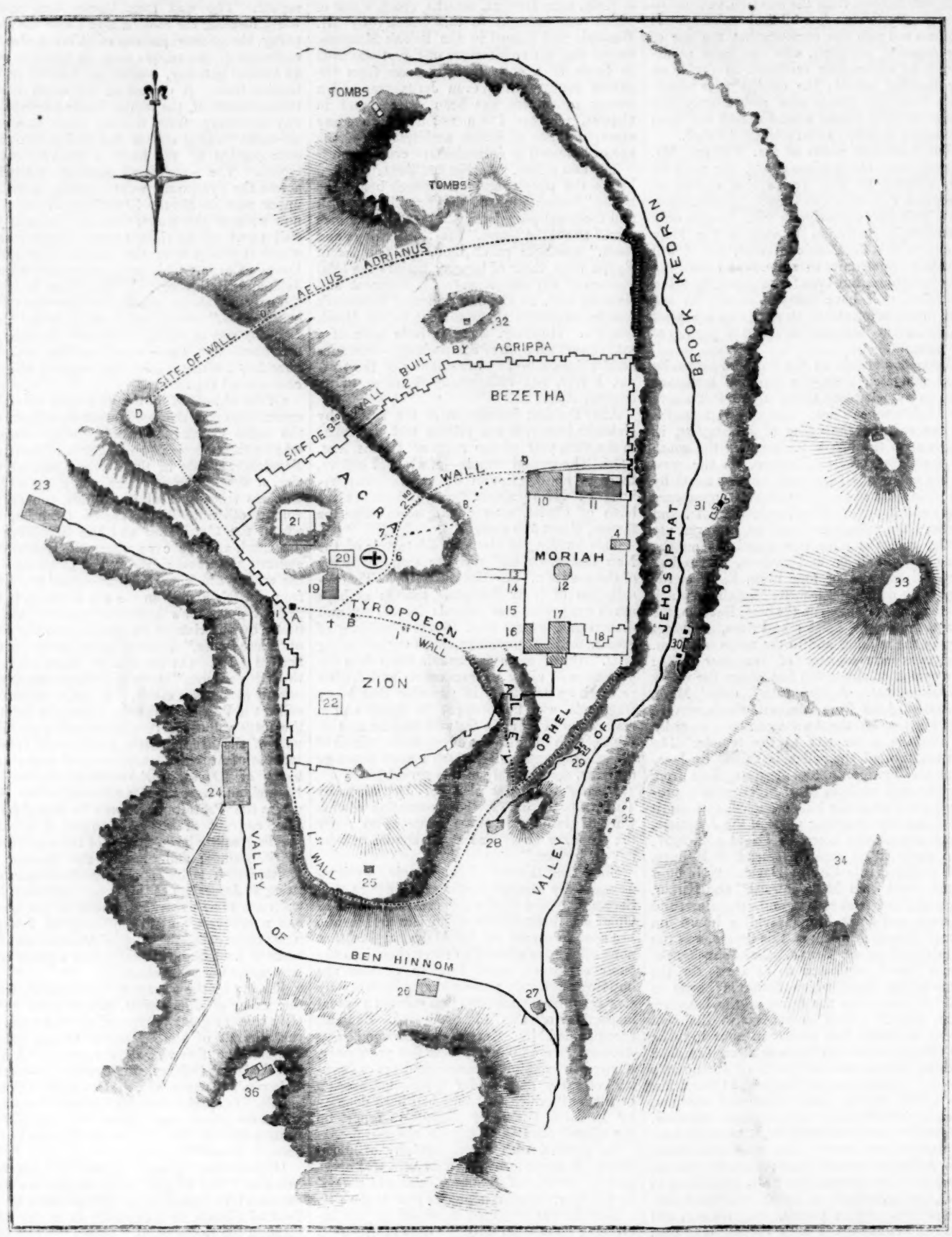
The sides of Zion, without the walls, contain a mosque on the site of the tomb of David; and the places of the sepulchres of the kings of Judah (probably formed in the rock) may be found buried under the accumulation of ages, and the ruins of the ancient palaces and buildings which once embellished this now half-

* 2 Chron., iii., iv., v.
† 2 Chron., ii. 18; v. 2—7.

* 2 Chron. iii. 15.

PLAN OF JERUSALEM, ANCIENT AND MODERN.

J. J. SCOLES, ARCHITECT, MENST.

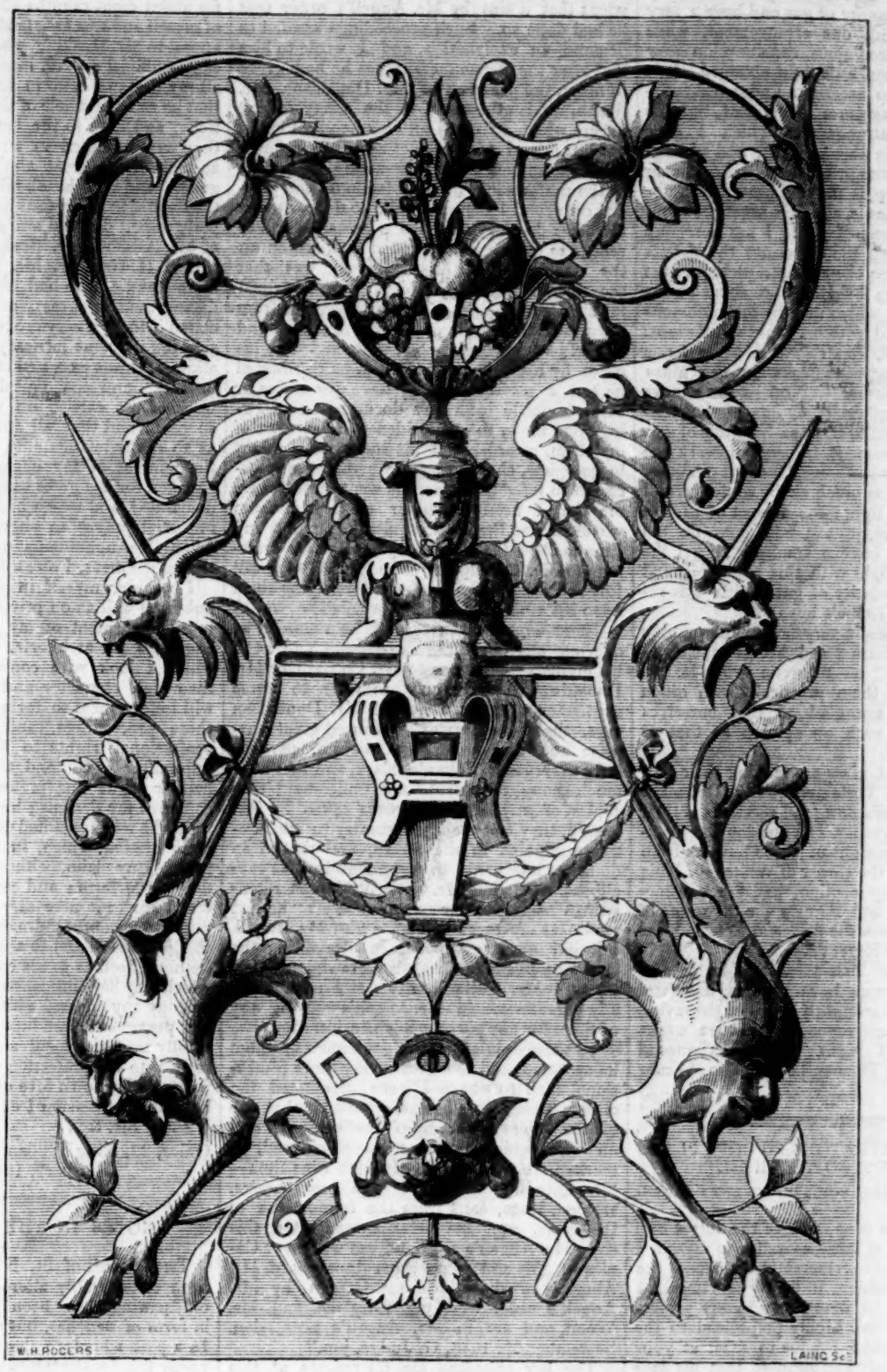


REFERENCES TO PLAN.

1 Bethlehem Gate.
2 Damascus Gate.
3 St. Stephen's Gate.
4 Golden Gate.
5 Zion Gate.
6 Church of the Holy Sepulchre.
7 Arch of Judgment.
8 Via Dolorosa.
9 Arch—"Ecce Homo."
10 Governor's House.
11 Pool of Bethesda.
12 Mosque of Omar.
13 Bazaars.
14 Beautiful Gate.
15 Jews' Wailing-place.
16 Ancient Bridge.
17 Mosque, El Aksa.
18 Subterranean Vaults.
19 Ancient Pool.
20 Greek Convent.
21 Latin Convent.
22 Armenian Convent.
23 Upper Pool of Gihon.
24 Lower Pool of Gihon.
25 Tomb of David.
26 Aceldema, or Field of Blood.
27 Pool of Nehemiah.
28 Pool of Siloam.
29 Fountain of the Virgin.
30 Tombs of Zachariah and Jehosaphat, and Pillar of Absalom.
31 Tomb of the Virgin.
32 Grotto Jeremiah.
33 Mount of Olives.
34 Mount of Offence.
35 Village of Siloam.
36 Hill of Evil Counsel.

A Tower of Hippicus.
B Tower of Phasaelus.
C Tower of Mariamne.
D Tower Psephinus.

CARVED BOOK-COVER, FROM STOWE.



cultivated spot of rudely-constructed terraces and slopes. The Aceldema, or Field of Blood, purchased with the money returned by the traitor Judas, is shewn on the south side of the valley of Hinnom. The earth from this spot was transported in 1218 to Pisa, to form that well known spot, the "Campo Santo."

The remains of reservoirs, called the Pools of Gihon, and an aqueduct from the Pools of Solomon, are the remaining objects of interest without the walls, to which it is necessary to direct attention. I should observe, that great care was taken to supply the city with water; besides the above pools, cisterns were constructed beneath the temple to receive the waters from the springs in that part, and Herod made large reservoirs on the towers he built to receive the rain from the heavens; and the drainage of the city was not neglected, for the remains of its ancient sewers exist to this day.*

J. J. Scoles.

* The conclusion next week.

CARVED BOOK-COVER FROM STOWE.

Ancient book-bindings are frequently found to offer fit subjects for the pencil of the student of design. They are of the greatest diversity of character, material, and merit, and are compact representatives of each successive change of style; indeed, a collection of bookcovers from the 9th to the 16th century would be in itself a complete epitome of the history of mediæval art. At the latter period in particular books were often bound with the most elaborate care, being enriched with stamped and gilt leather, carved wood and ivory, and occasionally even with gold, cameos, and precious stones. The late sale at Stowe has brought before the public the elegant, though somewhat grotesque bookcover of which we now present an engraving. It is of carved oak, and bespeaks itself as a work of the Renaissance, probably produced in France. In our own day, when book-binding is receiving so much artistic study and attention, we feel that every ancient example of merit may be regarded in the light of a practical hint, and that it is highly desirable in the progress of taste to measure, in some degree, that which may be effected by that which has been effected centuries ago.

LIGHT!

LESLIE'S TUBE-BURNERS.

In the course of an interesting lecture "On the Theory and Practice of the Production of Light," delivered by Professor Brande, at the Royal Institution, on the 2nd inst., the professor said,—The progressive improvements in the manufacture and management of coal-gas enable us to get a good light in a very simple manner, and to ascertain with tolerable accuracy the quantity consumed: but there is one point in connection with the subject of very great practical importance. I refer to the *quantity of gas really necessary to furnish a*

given amount of light, because it does not follow that, irrespective of modes of combustion, the same amount of gas consumed will furnish the same amount of light. You may burn a limited quantity of gas and have a very splendid light with one arrangement, while with another a prodigious consumption may be going on and but little light obtained. It is then important to ascertain under what circumstances a maximum amount of light is obtained. The arrangement which I have placed on the table this evening, and which I think brings the true principles of economizing gas into application, is the very beautiful "tube burner" of Mr. Leslie, which is most probably well known to many of you. I am sorry my time will not permit me to go into the details of the consumption of gas, but, perhaps, it is scarcely necessary; but there are some points about this flame which may be made obvious on the instant, and without long calculations. See the beautiful, clear, steady, white flame as it stands almost motionless in the glass "combustion-chamber." Now let me remove this glass and replace it by one of the common old cylindrical kind; the quantity of gas burnt is just the same as before, but every one sees that the light has lost all its best qualities. I have admitted too much air by so doing, and therefore get less light; the deposit of carbon goes on as before, but it now goes on too rapidly, and we have a smoke. To get the same amount of light with this glass we must burn twice the quantity of gas which was required with Mr. Leslie's burner.

Having expressed a very favourable opinion of Mr. Leslie's burner and his glass "combustion-chamber" on theoretic grounds, and since then tried them practically with much satisfaction, we are glad to find ourselves strengthened by such an opinion as that we have given above.

The burner and glass are making their way into use steadily. The exterior of the Ordnance office, Pall Mall, affords a good specimen of their value for street lighting. The London Gas Company have put on eight of these burners from Scotland-yard to the corner of Whitehall. This company, we may mention, has the contract with the Woods and Forests for the whole of Regent-street, from the palace at Westminster right through to Regent's-park.

At the General Post-office, St. Martin's-le-Grand, the burners have been in use three months, and if we are rightly informed the saving of gas over the corresponding thirteen weeks before is about eight hundred thousand cubic feet. The Thames Tunnel, also, is now lighted by them.

RIGHT OF ARBITRATORS TO COPY PLANS ENTRUSTED TO THEM.

ROYAL ITALIAN OPERA-HOUSE, COVENT GARDEN.

Sir,—Under a deep sense of the duty I owe to the profession at large, as well as to myself, I feel bound, however reluctantly, to expose the following facts, which, if tacitly sanctioned, I consider would be derogatory to my professional character and highly prejudicial to the ends of justice, and I hope to meet at your hands the candour and support that my case deserves, and which it is well known you never withhold.

The lessees of the Royal Italian Opera House chose, about a year after its completion, to contest two-thirds of my bill of 2,300*l.* for superintending the erection of it, &c., obliging me to institute legal proceedings to recover the balance of it, when, after paying into court 825*l.* more than they had offered me just before going to the jury, they begged a reference (which I had originally offered and they refused). To this I acceded, and Mr. T. L. Donaldson and Mr. T. Bellamy were appointed referees, and by them Mr. Samuel Angell was named as umpire, and, as the referees could not agree, Mr. S. Angell became the sole arbitrator and the depository of all my original designs and documents necessary to substantiate my claim.

On Mr. Angell's award being delivered, (of which, as you have, perhaps properly, refused to admit any comments on it, I must say nothing, whatever I may think), I applied at his office for my papers, and found to my astonishment that the most complete of my designs, working drawings, and papers, were missing from the portfolios and tin boxes, and that many had been copied in Mr. Angell's office by two of his assistants, one of whom, being found by me in the act, was obliged to admit that it was by Mr. Angell's order that he had done so. Such proceedings seemed to demand an explanation, and I wrote to him that after the solemn assurance he had given to me in the presence of Mr. Donaldson, Mr. Smith, and others, as to the safety of my papers when delivered into his hands, I could not but regard his conduct as wholly unjustifiable, inasmuch as he was acting as umpire in the performance of a professional and judicial duty, and I requested him to deliver to me the other documents in his possession, and to render to me the most explicit explanation on the subject. Mr. Angell's reply was that the documents I claimed of him remained in his strong closet during his absence from town, but he admitted that my drawings and extracts of my papers had been copied in his office by his authority, and that he considered he had a perfect right to have any copies or extracts made from any documents or drawings put in by me as evidence in support of my claim, in order that his memoranda might be complete, should there be hereafter any occasion to refer to it; and he went on to assure me that I need be under no apprehension whatever, and that he was quite prepared at any time to show the tracing made from my drawings to Mr. Donaldson, or to Mr. W. Cotterill (my solicitor), in expectation of satisfying them as to his mode of acting.

These explanations cannot be regarded as offering anything like satisfaction, and as to his giving explanations to Mr. Cotterill, or Mr. Donaldson, I have only to refer to these gentlemen's letters, in which Mr. Donaldson says, that "the award has caused great surprise and disappointment to him, particularly as regards Julian's salary, and that after much thought he could not understand why copies of my drawings were taken by Mr. Angell, they not being necessary to substantiate any point in the award, and that in so doing he had erred in judgment in this case altogether;" while Mr. Cotterill, the other gentleman referred to, wrote to me that "he had read over my correspondence with Mr. Angell, but did not see any use in examining the copies he had taken from my drawings. Certainly," Mr. Cotterill, says, "I cannot see any possible use in Mr. Angell's copying any of them for any purpose of the arbitration."

To these opinions of the gentlemen to whom he appealed, and of a great many more professional men to whom I have mentioned the circumstances, it is necessary to add, that one of the copies made from my designs, and on which his assistant was discovered, is marked No. 52, the title of which runs thus—"Longitudinal section of the new theatre, saloons, stage, &c., from the foundations to the roofs, complete as executed." On this copy Mr. Angell's assistant has written "Copies of this and some other drawings of Mr. Albano's works of Covent Garden by Mr. Angell's order were taken by me and Mr. Wood, and are in Mr. Angell's possession. September 27, 1848, G. Judge, jun."

The law affording me no redress at this stage, I am obliged to state now what otherwise I would under no other circumstances bring forward. I have been a member of the profession of civil engineers for a quarter of a century in this my adopted country, and have been engaged upon various works, which I presume have sufficiently established my claim to some ability; if not I would willingly allow my reputation to be estimated by what I have done at Covent Garden Theatre, the manner in which it has been accomplished, the very short period in which it was effected, and the smallness of the expenses attending it, considering that it required fifty-four original and elaborate designs, and above a hundred working drawings, specifications, &c. &c. (all put in evidence), besides daily and nightly attendance to the extent of from sixteen to twenty hours a-day, directing and superintending from the very foundations the construction and decoration of the new theatre, her Majesty's apartments, and the improvement of the whole establishment; converting at the same time the whole of the old materials; on which were daily engaged from 1,000 to 1,600 workmen of all trades, as well as the attendance of six of my assistants and a clerk of the works, all their expenses and salary being defrayed by me during above six months up to the opening of the theatre and for about eight months afterward the expenses of myself and two assistants. I can confidently appeal to Mr. Hosking, who, in his official capacity as official referee, inspected most minutely all my designs, and in his evidence declared that he saw the whole of the works and foundations, and that, to the best of his judgment, they were executed in an admirable manner, and displayed great ability without extravagance, and that he should not have allowed the theatre to be opened unless it had been properly done. I could also appeal to the evidence of Mr. Allason, Mr. Braithwaite, Mr. Godwin, Mr. C. H. Gregory, Mr. W. Laxton, and Sir John Rennie, who had often visited the works during their progress, and unanimously declared it to be a very creditable work, and considering its great intricacy and the short time allowed, it was executed in a scientific, workman-like, and economical manner, and as a work of art carried on with great skill and success: and they all spoke very particularly as to my indefatigability and the fairness of the amount of my charges for a work unequalled for the great sacrifice and exertion it demanded, and which had been admired by all impartial judges, to whom, as well as for the favourable unanimous opinion expressed by the public press, I owe a deep debt of gratitude.

I consider myself in duty called upon, on public as well as on private grounds, to appeal to the judgment of my profession, either as engineers or architects, to the members of which I look with confidence, satisfied that their high character and honourable feelings will induce them to form a right estimate of these proceedings, and will not allow my professional rights to be trampled on with impunity. I contend that Mr. Angell had neither right nor pretext whatever to take copies of my designs; his duty in the office to which he was appointed was to determine on the remuneration, which, in equity, I was entitled to upon my claim, without having any further duty to perform; and certainly nothing which could render it necessary or proper for him to retain copies of my drawings; and I leave it to the profession and to the public to form their opinion, both as to his conduct and the motive which may have influenced him on this occasion to copy my papers, which he still retains in his possession, conduct which I contend is wholly unprofessional and indefensible, and I refer it to the profession and to the public, on whose well-known love of impartial justice and hatred of oppression I can confidently rely.

I am, Sir, &c., B. Albano.

Office, 22, King William-street, Strand,
February, 1849.

NOTES IN THE PROVINCES.

The church of St. Nicholas, Ipswich, has been considerably altered and enlarged. The old pewing has been replaced by seating in form of benches, but with separate sittings. In a part added to the north aisle a window partly filled with stained glass has been put up, the stained glass the work and gift of Mr. R. B. King. The alterations in all have cost between 500*l.* and 600*l.*, of which the incumbent, Rev. M. G. Edgar, contributed 100*l.* and oak of equal value. Some curious carved figures, said to be of Saxon origin (?) have been discovered, and inserted in the north wall.——At the Ely sessions the propriety of taking down the old court-house at Wisbech, said to be in a dangerous state, and of erecting a new one next the gaol, was lately taken into consideration. It was stated that the old materials were worth 1,600*l.* to 1,800*l.*, a sum sufficient, it was said, to build the new one.——The foundation-stone of the Philanthropic Society's farm-school and chapel will be laid by H.R.H. Prince Albert on 30th April, near the Redhill and Reigate station of the Brighton Railway.——The re-building of Holy Rhood Church, Southampton, proceeds with quickness, and the style and dimensions of the arches, and the proportions of the chancel, are now rendered clear, but the roof of the building closely behind the east window is much complained of in the local papers.——The vicinity of Portsmouth has been much improved, it is

said, by the conversion of South-sea common into an agreeable park, by Lord F. Fitzclarence, and others, with the Clarence esplanade crowning the beach, and now a favourite promenade. ——Two new veins of coal, between 5 and 6 feet thick, have been discovered in the parish of Radstock, on the Countess of Waldegrave's property, by Mr. Charles Ashman, the engineer and manager of her ladyship's other mines. The poor people in the parish are in joyful anticipation of employment, and general rejoicing has been manifested by the ringing of bells, &c.——A Liverpool paper says, with reference to the Birkenhead Docks, "It is now certain that these works must go on. The contract has been 'signed, sealed, and delivered,' and on Thursday the dock trustees held meetings for the purpose of arranging the details of the works."——The guardians of the Wincanton Union have accepted the tender of Messrs. Miles and Golding, of Shaftesbury, for the enlargement of their workhouse. There were five tenders given in for the work, and the difference between the highest and lowest was 316*l.*; the one accepted being 530*l.*, and the highest from a builder at Frome), 846*l.*——Mr. Walker, engineer, and Mr. May, the resident engineer, have surveyed the whole line of the Caledonian Canal from end to end. Every part of the canal, from the summit level westward, is said to have been in good order.——The Glasgow Harbour works at Springfield have been rather seriously interfered with by a heavy flooding in the Clyde, which filled the excavations. The new line of quay, however, is in an advanced state of progress.

METROPOLITAN COMMISSION OF SEWERS.

A GENERAL court was held on Thursday last, the 15th, at the Sewers Court, Greek-street, Soho-square; Lord Ebrington, M.P., in the chair. On the recommendation of the finance committee, several payments were ordered, and amongst the rest, a cheque was directed to be placed in the hands of Mr. Groom, the official assignee in bankruptcy, for the amount due to Mr. Starkie, the contractor for the Grosvenor-square sewer, from the late Commissioners of Sewers, prior to his bankruptcy. This long-litigated affair will now be brought to a close on the solicitors of this court receiving a satisfactory acknowledgment of the same. All the real business of the commission seems now to be done snugly and quietly in committee, a system against which, when in the old Westminster commission, one at all events of the present commissioners was in the habit of protesting pretty constantly and loudly,—whether rightly or wrongly we do not stop now to inquire. The new Sewers Act appears to be very defective in several points, and is felt to be so by the Commissioners. Those who drew it up don't exactly understand the operation of some parts of it; so, unless we are wrongly informed, other opinions have been sought.

ENCROACHMENT ON THE NEW ROAD, ISLINGTON.

METROPOLITAN IMPROVEMENTS.

REGRETTING equally with your correspondent "Viator," that the line of this road is being constantly trenched upon by the erection of buildings upon the fore-courts of the houses, I am sure he cannot be aware of the various attempts that have been made from time to time to prevent this great evil, or he would have thrown his sarcasm upon the parties who have really caused an Act of Parliament, intended for the protection of this line of road, to become totally inoperative, rather than have censured the parochial vestries, who have neither foolishly nor culpably neglected their duties, but have endeavoured to enforce the law, though without avail, the magistrates refusing to convict. Further, the very parties who should have supported them have been the first to infringe its regulations, as may be seen in the instances of the Park-crescent, York-place, &c., which were advanced beyond the prescribed limit by the Commissioners of Woods, &c.; and latterly the official referees defined the line of frontage of two public buildings as being 50 feet back from the footway, while a few months subsequently these gentlemen came to a resolution to allow these erections on the fore-courts one story in height in roads 60 feet in width,—and, consequently, a few hundred yards off, two private buildings are now in course of erection at the western end, adjoining the Edgeware-road, as well as those referred to by your correspondent near Osnaberg-street. So much for the protection of the public interests to be derived from central commissioners, whom your correspondent is so enamoured of, who to-day undo that which they have given effect to on the previous one. I am quite satisfied the parochial vestries of this metropolis have public spirit enough to place themselves above private interests, and only require the aid of the administrators of the law to maintain inviolate the powers vested in them, but which, unfortunately, is rarely given where the public interests are concerned, thereby aiding the designs of those whose interests it is to advance centralization, to the prejudice of the great fundamental law of this country,—local self-government. C. E.

THE COST OF THE CITY AND SURREY GAOLS.

IF we were to print some of the comments we have received on this matter generally, they would displease more persons than one, and so far as we can see would do no good. Considerable surprise is expressed as to the difference of cost between the two prisons. The Surrey prison, to be built on Wandsworth-common, is to contain, as we understand, 790 cells, including chapel, laundry, boundary walls, and airing-grounds. The city prison, to be built at Holloway, is to contain 500 cells, chapel, laundry, and boundary walls. The Surrey prison is to cost 130*l.* per cell, and the city of London 184*l.* per cell. How is this difference made? say some. Some part of it is to be attributed to the introduction of masonry in the city prison; and it may be that more fittings are included in one than the other.

The difference between the highest and the lowest tenders, 17,410*l.* in one, and 11,720*l.* in the other, sounds large, especially as it was made wholly in the pricing,—the quantities being supplied: but looked at as a per centage on the amount, it is not so great as is often the case. The lowest tender for the city may be called 16 per cent. less than the highest, and that for the Surrey prison rather more than 10 per cent. One of our correspondents says that the charge made by the surveyors for taking out the quantities for the city prisons, including lithographing the bills, was 2,824*l.* The 2½ *per cent.* pays better than the 5.

THE RIVER-WALL OF THE HOUSES OF PARLIAMENT.

A FEW days since, in passing over Westminster Bridge, my attention was drawn to the works now in progress for the purpose of removing the dam in front of the new palace. I was not a little surprised to observe that the piles forming the dam were being *drawn*. On a closer inspection I observed that these piles were a distance of at least 16 feet in the ground. Now it struck me as being a most ill-advised plan to draw these timbers at all, inasmuch as the operation amounts to cutting a trench, or rather two trenches, there being two rows of piles, the whole length of the river frontage, and 16 feet deep, which I am disposed to think, with that unfortunate spectacle Westminster Bridge before one's eyes, is, to say the least, running an unnecessary risk. Moreover, as there is no good end served, I cannot conceive what can have been the motive for drawing the piles instead of cutting them off level with the proposed ground line, which every practical man knows could have been done at an expense of certainly not more than 500*l.* or 600*l.* over the present method, and there would then have been scarcely a possibility of the river frontage ever being injured, inasmuch as the timber left in the ground would have afforded an additional security in the event of the present bridge being removed, and another erected in all probability on a fresh site, which is as likely to cause an alteration in the set of the tide, and thereby to deepen the river bed, as did the removal of the old London Bridge.

I repeat, that without any end served, it is a matter of astonishment that the present course should have been pursued. I am aware that there is a line of piles at the foot of the river wall intended as a protection, but still the fact of disturbing a mass of ground to such a depth (to the bottom of the sheet piling) within a few feet of the wall, is most unadvisable. True, no immediate injury may result, but look at the bridge. I have no doubt, that when that structure was completed, it was deemed a substantial erection; but what has time proved it to be? And it may fairly be said, that a little foresight would have prevented its present deplorable appearance and a large outlay of money. Gain experience from the past: a motto which in this instance is deserving particular attention. T.

Miscellanea.

ISLINGTON MARKET.—This market was built by the late Mr. John Perkins, about fifteen years since, having obtained an Act of Parliament, which gives the power of holding the market, of slaughtering cattle, melting the fat for tallow, manufacturing the offal, &c. The area within the walls is 15 acres, and for the sake of comparison, to enable any one to judge of its extent, we will quote Russell-square, which contains 11 A. 1 R. to the walls of the houses, and Lincoln's-inn Fields contains 10 A. 1 R. 29 P. There is accommodation for 8,000 head of cattle and 50,000 sheep, besides layers having 3,280 feet in length of roof, or nearly 2 acres. The extent of freehold property, upon which there are thirty houses, is 7 acres, exclusive of the market, and 7 acres leasehold, upon which it is intended to erect abattoirs and a dead-meat market. A main public sewer passes within 300 feet of the eastern entrance, and it is 18 feet lower than the surface of the market. The East and West India Dock Railway passes to within 400 yards of the market.

ARTESIAN WELL AT HADHAM.—I observe in the last number of THE BUILDER, that a correspondent wishes to know if it be practicable to fix a lifting pump in an Artesian bore of 6 inches diameter, the water level of the spring being 178 feet from the surface: such an operation is possible; it is obvious the rod should be arranged and steadied inside the rising main. The bucket and clacks require periodical examination; means of access to them should therefore be provided; indeed, facilities should be given for removing the whole pump, combined with perfect steadiness when fixed: it is almost needless to remark the pump must on no account choke up the bore. These matters require care in detail, and should be directed by a professional man. —JOHN G. SWINDELL, 3, Kilburn Priory.

IMPROVEMENTS IN PARIS.—For completing the Louvre the estimates are—for the ground required for completing the Louvre, 6,379,250f.; for the buildings and other works, 23,000,000f.; and for the continuation of the Rue de Rivoli, 3,119,630f. The Municipal Council have come to the resolution that the city should contribute the 3,119,630f. towards the continuation of the Rue de Rivoli. The plans for the new buildings comprise the establishment of the National Library, in the wing to be constructed towards the Rue de Rivoli, special galleries for the annual exhibition of the works of modern painters and sculptors, and for the periodical exhibition of the products of the useful arts, next the gallery of the Museum; and the formation of an intermediate quadrangle, with a colossal fountain in the centre, surrounded by four quincunxes, ornamented with statues.

ORSI AND ARMANI'S METALLIC LAVA.—Of this material for paving we have already spoken briefly without offering any opinion on its merits, time being necessary to decide these. It would really seem, however, well deserving examination and to have many advantages, especially in places where the surface of other floorings would be made moist and mouldy by rising damp. Messrs. Orsi and Armani have produced from our pages, in their black and white lava, some of the mosaics from Pompeii, which we gave in a recent number (page 3).

Projected Works.—Advertisements have been issued for tenders, by 1st May, for repewing, &c., Bridgewater Church (with plans and drawings); by March 5th, for an addition, alteration, &c., at a shop in Caistor, Lincolnshire; also for a shop front with mahogany sashes and plate glass; by 24th, for the erection of a new aisle, &c., for Chiselhurst Church, Kent; by 12th, for the erection of the new workhouse for the Fulham Union; by 1st, for the erection of certain almshouses at Hereford; by 28th inst., for rebuilding the parish church at Birch, Essex; and by 2nd March, for lighting the public lamps in the Grosvenor-place district with gas for five years or more.

Literary Institutions and Taxes.—The claim of the Greenwich Scientific Society to have their building exempted from taxes has been rejected by Baron Alderson, Anti-corn-law and other meetings having been held in it.

Chelsea Improvement Act.—Rating.—Mr. Bult, of Chelsea, having declined to pay the Chelsea Improvement rate, was summoned before Mr. Burrell, at Westminster. Mr. Bult argued that he was not bound to pay, because the 174th section of the Chelsea Improvement Act stated, "that it shall be lawful for them (the commissioners) to make a rate upon the occupiers of all messuages, &c., which *at the time of passing this Act* were by law liable to be rated to the repairs of the highways within the said limits," and neither his house nor any part of the street in which he resided was built at the time of the passing of the Act. He had come forward to oppose the claim from a sense of right, and complained that there were no gutters or gulley-holes in his street to carry off the rain, that there was no road formed, that it was in a most filthy and unwholesome state, that his own and family's health had been much affected by exhalations from filthy matter, and that his three children had but recently recovered from fever, caused by the nuisances produced by the filthy condition of the street.—Mr. Bodkin, on the part of the commissioners, said that the construction put upon the section was monstrous. The section clearly intended to mean, not the identical buildings at that time in existence, but all that description of property which should subsequently be erected. The magistrate took the same view of it, and declared Mr. Bult liable to the rating.

Sir Hans Sloane's Monument.—With reference to the recent remarks in The Builder, on the monument to the memory of Sir Hans Sloane, which stands at the east corner of the old churchyard, Cheyne-walk, Chelsea, this monument, as well as the inscription in its present dilapidated condition, demands the attention and aid of the public, in order that it may be restored and saved from the ravages of time, so that the memento, erected with so much liberality to the memory of the scientific attainments, devoted to the use and benefit of the public, of so celebrated a character, may be handed down to posterity. At a time when other improvements were being effected in this neighbourhood, the churchwardens wrote to the family of the late Sir Hans Sloane, calling their attention to the dilapidated state of the monument, in the hope that they would cause the same to be repaired. The answer they received to his communication was, I believe, that the property had been dispersed, and that no funds remained in the hands of the trustees or executors, applicable thereto. The churchwardens, not having any funds which they can legally lay out in its repair, and the inhabitants also having already expended much upon the improvements, there remains but little probability that anything can be done to rescue it from decay and ultimate ruin, unless, by being brought before the public through the medium of your widely circulated journal, there may be found among the various scientific bodies of our country, and public spirited individuals, a sufficient number who may feel sufficiently interested in the matter so as to aid by a small subscription, the repairing and restoring the monument. J. Perry.

Chelsea.

N.B. The Worshipful Company of Apothecaries are the trustees for the public of the collection, at Chelsea, of Sir Hans Sloane's botanical specimens.

Lavatories for the British Museum.—Now that the "commissioners" have instructions to improve the arrangements of the Museum, it will be well for them to bear in mind the necessity of providing greater conveniences for those who frequent the library. A lavatory is rather a necessity, if only for the protection of valuable works from being soiled, than a luxury. The present arrangement of the conveniences for the gentlemen is very unsatisfactory, and in any alteration the ladies should be consulted.

Birmingham Workhouse Competition.—The guardians resolved that the report of the committee should not be received, but that the six selected plans should be submitted to the test of ballot. On the 21st the votes were taken, and the result was a majority of 10 for Mr. Hemming; the numbers being—Hemming, 36; Drury and Bateman, 26. The whole affair is very discreditable to the Board.

Prevention of Corrosion.—According to the *Chemical Times*, the best means of preventing the corrosion of metals is to dip the articles first into very dilute nitric acid, to immerse them afterwards in linseed oil, and to allow the excess of oil to drain off. By this process metals are effectively preserved from rust or oxidation.

Norman Tower, Bury St. Edmunds.—The committee have reported to the subscribers that the restoration of the tower is completed. 3,100*l.* have been disbursed, and about 300*l.* remain to be paid.

Very Blind Builders.—I beg to inclose, says one correspondent, and seven others have done so in other words,—a specimen of estimating as exhibited on the 15th inst. at the offices of Mr. Lambert, for finishing fourteen 8-roomed houses, now in carcass, building outhouses, &c. There is evidently something very wrong in the system of contracting now followed by some men. One would think they were entirely ignorant of what they were doing, or grossly dishonest; one or the other is quite apparent.

H. Search	£5,420
R. Newport	5,026
T. Howard	4,982
Thos. Burton	4,951
J. Rivett	4,712
W. Higgs	4,647
R. and E. Curtis	4,484
W. Norris	4,397
J. Foot	4,340
W. Perry	4,289
A. Cripps	4,190
W. Blenkham	4,179
D. Bodger	4,094
J. Mullins	4,018
W. Loynes	4,000
E. Mares	3,985
J. T. Taylor	3,960
Walker and Soper	3,947
J. J. Billson	3,875
J. Raycrup	3,750
G. Bugg	3,500
J. Sutton	3,430
W. Pillbeam	3,298
D. Catlin	3,290
J. Greenwood	3,000
C. Lloyd	2,920
J. K. Vote	2,656
J. Vaughan	2,548
J. Pooley	2,175
J. Richards	1,999

Cost of the Small-pox Hospital.—Sir: It seems very desirable for the sake of competitors, that you should print the tenders for the Small-pox Hospital: Mr. Daukes, architect:—

Pritchard	£19,930
Smith	19,410
G. A. Young	18,549
Lee and Son	18,300
Holland	17,699
Patrick	17,430
Grimsdell	17,085
Kelk	16,953
W. Cubitt and Co.	16,900
J. Locke and Co.	16,600
Myers	16,431
Messrs. Piper	15,938

These amounts are exclusive of the foundations and drains, which have been put in at an expense of 2,800*l.*—An Architect who tries to be Honest.

*** We have received some letters commenting in strong terms on the conduct of both committee and architect, but are not disposed to insert them, except with the writers' names attached.

A Good Movement in the School of Design.—At Somerset House an association of the students has just been formed, for the purpose of mutual improvement, the first meeting of which was held on Saturday, the 10th, in the large room at Somerset House, the use of which has been granted by the council. An introductory paper was read by Mr. D. W. Raimbach, the substance of which we shall give.

Exposition of Inventions. — It is thought, with reason, that a free exposition of patented and registered inventions would be an advantage to the public, and at the same time, facilitate the object which manufacturers have in view, viz., making their inventions generally known, and it is intended to open an exposition of the kind at the Baker-street Bazaar. A manager and assistants will be appointed, for the purpose of explaining the use and advantage of each invention, and to effect sales.

Shape in respect of Area.—Having seen, some time since, in The Builder, some questions as to the squaring of numbers, it occurred to me that it would be interesting to mention a fact relating to the areas of squares for buildings. A figure which has all its four sides equal, contains the greatest area within the same length of wall, viz.:—

Feet.	Feet.	Feet.	
80^2 =	6400	and 320	length of walls.
60 × 100 =	6000	and 320	,,
70 × 90 =	6300	and 320	,,
50 × 110 =	5500	and 320	,,

This may be useful to those concerned in building warehouses, &c., which case first called your obedient servant's attention to the fact.—R. B. Grantham.

Wooden Barn Floors and Rats.—Barn floors may be made impervious to rats by the following cheap method:—Dig around the building that has its foundations in the ground (in contradistinction to those supported on stone or brick piers), a dry area, say 14 inches wide by 9 inches deep, pave the bottom with brick flats, the side farthest from the building to have two courses of 4½-inch work, whilst the other has a course of plain tiles or slates, nailed to the outside surface of the building: as this is finished, fill in the area with the earth dug out. The rats will endeavour to make their entrance by burrowing, but they will invariably work themselves out at the surface, as they cannot effect their object, try how or where they will, and cunning as they are, they never commence burrowing away from the building, but close around it. This plan has never failed: rid yourself of the inside members and no outsiders can enter. The doorways may be similarly secured by carrying up a dwarf wall along the opening.—John B. Watson.

Improvement in Scotland.—The writer of a paragraph relative to Dundee, which appeared in your paper of last week, under the signature of "*One who has used his Olfactories*," is entitled to the thanks of every well-wisher of Scotland. Aware of the high estimation in which The Builder is held in Scotland, would you permit an admirer of that country to suggest, not only to the inhabitants of Dundee but to those of Scotland generally, that probably the most delicate and esteemed compliment they could pay to the Queen and Prince Albert, would be for the upper and middle classes in every parish throughout the country, by their example, advice, and assistance, to endeavour to effect an improvement as regards cleanliness in the habits of the lower classes. If each parish had a distinct society formed for the purpose of carrying out such improvements, great, doubtless, would be the benefits derived therefrom; and it would ere long become a brand and a disgrace to build houses without having the usual *conveniences* attached.—R. B.

Breathing Room for the Tower Hamlets.—Some eight years since I proposed (through the medium of the press), the removal of that disgusting, and very unwholesome nuisance, the Tower ditch or moat, and at the same time suggested that its site might, advantageously, be converted into a public garden or promenade. Shortly after I had the gratification of seeing my proposition partly acceded to. The ditch was drained, but instead of completing the above arrangement, the bed was merely levelled (and not raised as I intended), and is now used once or twice a-

month, as an exercise ground, for the soldiers stationed within the garrison. Now, Sir, I appeal to you, as the acknowledged champion of metropolitan improvement, and ask your aid, in behalf of this densely peopled locality, in urging the Government to grant at once this highly desirable alteration, for no part of London is so destitute of "breathing" places as the Tower Hamlets. I had intended speaking also of the enclosure in Trinity-square, Tower-hill, admission to which can only be obtained by paying "to some one" a fee of two guineas per annum, but will reserve that for a future occasion.—N.

MEETINGS OF SCIENTIFIC BODIES

Held during the ensuing week.

TUESDAY, Feb. 27.—Institution of Civil Engineers, 8 P.M.
WEDNESDAY, 28.—Society of Arts, 8 P.M.
THURSDAY, March 1.—Royal Society, 8½ P.M.; Society of Antiquaries, 8 P.M.
FRIDAY, 2.—Archæological Association, 4 P.M.

TO CORRESPONDENTS.

Received.—"Z. Z. Z." (ask a merchant), "J. N. C.," "T. C.," "W. J.," "C. B., jun.," "C. H. W." (thanks), "D. T." (Hull), "G. P.," "F. A.," "E. S.," "W. W." Derby (thanks: such an arrangement does not deserve record), "W. H.," "A. R. H." (we should say, as in heraldry, that the *south* wing of Buckingham Palace is the "right"), "Constant Reader," "H. Lee" (we are unable to advise), "J. C." (we should use the Caen), "F. E. K.," "W. D." (already mentioned), "J. G." (the suggestion has been made before), "An Architect" (Birmingham), "T. L." (Chester), "J. S.," "W. S.," "W. M.," "Old Subscriber" (we have several times stated what we know as to destroying ants, and cannot repeat ourselves), "J. C." "Humboldt's Cosmos," translated, with author's sanction, under direction of Colonel Sabine, 2 vols. (London, Longman and Co.; John Murray,—1849); "The Public Health with National Gain," pamph. (Ridgway—1849); "Tenant Right," digest of the evidence before Committee of House of Commons (London, Rogerson: Ridgway,—1849); "Railway Taxation," by S. Laing, Esq., pamph. (London, Vacher,—1849); "Rudimentary Mechanics," by Charles Tomlinson (Weale's Series).

"*Books, Prices, and Addresses.*"—We have not time to point out books or find addresses.

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ADVERTISEMENTS.

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TO ARCHITECTS.—COMPETITION AND OTHER DRAWINGS.

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(A most successful combination of the above principle, with other patented improvements.)

By Her Majesty's Royal Letters Patent.

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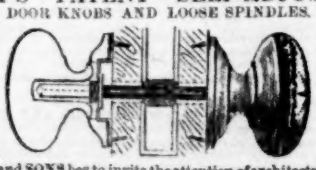

HART and SONS beg to invite the attention of architects, builders, and others, to their Door Furniture, mounted for PITT'S PATENTED SPINDLES. The knobs are stronger, more durable, and more elegant in form, than those in ordinary use, as the spindles, being loose, do not require the objectionable side screw. They are more readily fixed, are suitable for every description of lock now in use, and, as they adjust themselves to doors of different thicknesses, without alteration, are particularly adapted for the country or for exportation. They are made to suit every style of decoration in China, crystal, amber, and opal glass, buffalo, horn, ivory, ebony, brass, &c., en suite with finger plates, bell-pulls, levers, &c.—May be obtained of all ironmongers; or of the proprietors and sole manufacturers, HART and SONS, Wholesale Ironmongers, 53, 54, and 55, Wych-street, Strand, London.

N.B. PITT'S PATENTED SPINDLE, being the only one that does not require a screw in the side of the knob or mounting, the use of any lock furniture without such side screws would be an infringement of the patent.

ARCHITECTURAL EXHIBITION.—All ARCHITECTURAL DRAWINGS, MODELS, &c., intended for the approaching EXHIBITION, are to be sent to the Gallery of the New Society of Painters in Water Colours, Pall Mall, on the 1st and 2nd of March. The Drawings may be either framed or on strainers.—Further particulars may be ascertained on reference to ROBERT C. DUDLEY, WILLIAM W. DEANE, } Hon. Secs.

Architectural Association, Lyons' Inn Hall, Strand.

PATENT GALVANIZED IRON.—Todd v. Gell.—Public Notice.—The Galvanized Iron Company, 3, Mansion-house-place, London, inform the trade and the public that the iron sold by the defendant was not supplied by them.

N.B. No tin is used in the company's process.

PATENT GALVANIZED (Incorrodible) IRON, for roofs, sheds, sheathing for ships, standing rigging, &c., bolts, rings, nails, screws, wire (all sizes); also for agricultural implements and household utensils.—Apply at the Office of the Galvanized Iron Company, 3, Mansionhouse-place, for specimens and full particulars.

N.B.—A liberal discount to the trade.

BUILDERS and CARPENTERS' IRON- MONGERY WAREHOUSE, 18, Blandford-street, Manchester-square, leading out of Baker-street, Portman-square. Lists of prices may be obtained on pre-paid application.

JOHN and EDWIN YOUNG, Proprietors.

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IMPROVED CIRCULAR SAWS, Upright Saws, for timber and deal frames; Patent Tempered Machine Plane Irons, saw files, improved engineers' files; Patent Tempered Machine Knives, and cutters of all descriptions, made on the most scientific and economical principles, with dispatch, by BLAKE and PARKIN, the Meadow Steel Works, Sheffield.

LAP WELDED IRON TUBES.—W. H. RICHARDSON, Jun., and Co., MANUFACTURERS of every description of WROUGHT IRON TUBES for Locomotive and Marine Boilers, Gas, Steam, and other purposes.
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IRON FOUNDRY, 80, Goswell-street (late of Brick-lane, St. Luke's).—J. J. JONES having made great additions to his STOCK of PATTERNS, begs to inform the Trade, that he can now supply them with Plain and Ornamental Iron Columns Girders, Railings, Gates, Iron Coping, Balconies, Window Guards, Verandahs, Ornamental Staircase Panels, Iron Staircases, Tomb Enclosures, Trellis Panelling, Lamp and other Brackets, Cantilevers, Newel Bars, Water Closet Work, Area Gratings, Fly and other Wheels, Wheel Plates, &c.

BAKER'S OVEN WORK, Forge Backs and Troughs, Rain Water Pipes and Gutters, Sash Weights, Furnace Bars, Stoves, Ranges, &c., always in stock.

TO ENGINEERS, BUILDERS, PLUMBERS, &c.

RAIN-WATER PIPES, Heads, Shoes, and Elbows, half-round and O G Gutters, Sash Weights, Railing Bars, Sink Gratings, Air Bricks, close and open Coal Plates, Scrapers, Tile Lights, Balcony Panels, narrow and navy wheels, &c.

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GAS-FITTINGS, LAMPS, and CHAN- DELIERS.—THOMAS LEDGER, 173, Aldersgate-street, London (two doors from Little Britain), Brass-founder, Gas-fitter, and Manufacturer of Chandeliers, Lamps, and every description of Gas-fittings. Estimates furnished, and experienced workmen sent to any part of town or country. Builders and the Trade supplied.—Warehouse and Show-rooms, 173, Aldersgate-street; Workshops and Foundry, 132, Aldersgate-street.

CHEAP GAS.—Consumers of Gas and Shareholders in the Metropolitan Gas Companies, should read the leading articles of the "JOURNAL of GAS-LIGHTING," suggesting a plan for the supply of Gas in the Metropolis, at the lowest possible rate, and lower than it can be obtained by any other combination.—To be had of WM. STRANGE, 21, Paternoster-row; or through any Bookseller or News-Agent. Price 1s.

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ARBROATH PAVEMENT.—To MASONS, BUILDERS, and STONE MERCHANTS.—The undermentioned has now lying in the river, and at Quebec-wharf, Rotherhithe, a cargo of the best Paving Stones, tooled, rubbed, and machine-dressed, in sizes suitable for the trade, to be sold cheap.—Apply to Mr. ALEX. REID, 4, Fish-street, Tower-hill, or PEAT and ROBERTSON, 4, Richard-street, Cornwall-road, Lambeth. Also daily expected a cargo of Rockhill.

BATH STONE.—Messrs. DANIEL and CHARLES JONES announce to Architects and Builders, that they continue to supply the FARLEIGH and COMBE DOWN STONE of the best qualities upon the most reasonable terms.—Bradford, Wilts.

PORTLAND STONE.—To Builders, Stonemasons, &c.—TO BE DISPOSED OF, about 6,000 cubic feet of PORTLAND STONE of the finest quality, sound, of a good colour, and in long lengths; standing and being the front of the old Gaol at Chelmsford,—consisting of 3 and 6-inch tool-stroked ashlaring, semi arches, strings, cornices, vermiculated quoins, blockings, and rusticated base courses.—Apply at the Gaol; or to Mr. RICHARD TRESS, Architect, Little St. Thomas Apostle, London, where a sketch of the elevation may be seen.

RANDELL and SAUNDERS, QUARRY- MEN and STONE MERCHANTS, BATH. The most approved kinds of Bath Freestone supplied to all parts of the kingdom. Depots at the Great Western Railway Stations PADDINGTON, CORSHAM, BOX, BATH, and BRISTOL.—R. and S. particularly invite the attention of Architects and Builders to their Corsham Down Stone, which is strong and sound in quality, is of beautiful colour and texture, and works much cheaper than any other stone. Prices, with cost of carriage to any locality specified, furnished on application to Randell and Saunders, 14, Orange Grove, Bath.

TERRA-COTTA, or VITRIFIED STONE WORKS, King Edward-street, Westminster-road, London.—H. BLANCHARD, from late Coade's Original Works, Belvedere-road, Lambeth, begs to inform the Nobility, Gentry, Architects, and Builders, that he has re-established the manufacture of that invaluable material, which has been successfully adopted by our eminent Architects and others, in the adornment of our noblest buildings, nearly 100 years has proved the imperishable nature of the material, the specimens of those times now exhibiting all their primitive sharpness.

Groups, statues, friezes, capitals, panelling, pinnacles, finials, terminals, Tudor, and other chimney shafts, balustrading, fountains, fonts, tazzas, vases, coats of arms, devises, and every description of architectural ornament, at prices in many instances nearly half the cost of stone.

Specimens of the material to be seen at the Office of "The Builder," 2, York-street, Covent Garden, and at the Works.

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N.B. The stone used in the erection of the New Houses of Parliament was supplied EXCLUSIVELY from these quarries.

ANSTON STONE, used for Building the New Houses of Parliament.—W. WRIGHT and Co. beg to inform Architects, Engineers, Builders, and others, the Anston Stone can be supplied in any quantity on the shortest notice. This valuable stone, so celebrated for its durability, colour, and texture, is well known, having been selected in preference to all others, by the Commissioners of Woods and Forests, for building the New Houses of Parliament. It is very superior for Monuments, Tombs, &c. &c.

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AUBIGNY STONE QUARRIES.— LUARD, BEEDHAM, and Co., beg to inform the Architectural and Building Profession generally, they are importing the above stone from Aubigny, near Falaise, Normandy; and from its general adoption (where known), are assured of its great utility.

Aubigny resembles Portland in colour and texture, but free from shell, flint, and other obstructions in working. Its durability may be known from its appropriation to lighthouses, dock and quay walling, and the Royal Chateau, Normandy.

L. B. and Co., have a large and seasoned stock at their Depot, Caen Sufferance Wharf, Rotherhithe, near the Lavender Dock Pier.—Orders executed with dispatch to any part of the United Kingdom.

CAEN STONE SPECIALLY SELECTED. LUARD, BEEDHAM, and Co., extensive Proprietors of CAEN STONE QUARRIES, Allemagne, Calvados Department, beg to solicit inspection of their Caen Stone for external and internal works. They continue their importations of the first quality, carefully selected at the quarries.

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SAMUEL CUNDY, Mason and Builder, PIMLICO MARBLE and STONE WORKS, Belgrave Wharf, Pimlico, begs to inform ARCHITECTS and the PUBLIC that he has availed himself of improvements in his MACHINERY, by means of which he is enabled to produce GOTHIC WINDOWS, MOULDINGS, PANNELS, &c. &c., at a very cheap rate, out of a superior stone from the west of England, as durable as any soft stone, and particularly sound.

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Vein Marble Chimney-pieces, of the best quality of material and workmanship, by improved machinery	40s.
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SLATE SLABS.—Mr. MAGNUS having machinery in Wales capable of sawing and planing some thousands of tons annually, is enabled to supply the public at a much lower rate than any other house not possessing the same facilities. Parties ordering large quantities will be allowed a considerable discount off the recently reduced price list.—Address, MAGNUS, Pimlico Slate Works.

REMOVAL.—ITALIAN and GALWAY MARBLE QUARRIES DEPOT, Whitehall Wharf, Parliament street, Westminster.—Mr. FRANKLIN, Proprietor of the above Quarries, informs the Sculptors, Marble Masons, Builders, &c., that he has REMOVED his Depôt from Pimlico to the above address. Arrived from his Quarry at Galway:—3,000 feet of Black Slabs; 700 feet Cube Blocks; 8,000 feet of Flagging.—At Bristol—*Ex Mary Ann*, Leghorn: 1,600 cubic feet of various Marbles in first quality statuary, Veined Dove, Bardilla, Sicilian, black and gold, and Sienna.—From Galway: Black, in Blocks and Slabs.—Arrived *ex Venice* and *Echo*, at Whitehall Wharf, 49 Blocks of Statuary, and two open.